AMENDMENTS TO THE CLAIMS

Claims 1-3 (Canceled).

Claim 4 (Currently amended): An apparatus for storing data, said apparatus comprising:

a fixed electrode electrically coupled to

a storage medium having a plurality of different and distinguishable oxidation states wherein data is stored in said oxidation states by the addition or withdrawal of one or more electrons from said storage medium via the electrically coupled electrode;

said storage medium comprising a storage molecule having a plurality of different and distinguishable oxidation states wherein said storage molecule comprises a first triple-decker sandwich coordination compound covalently linked to a second triple-decker sandwich coordination compound wherein the first compound and the second compound are different triple-decker sandwich coordination compounds;.

~~The apparatus of claim 1,~~ wherein said storage molecule comprises a triple-decker sandwich coordination compound having a formula selected from the group consisting of $Por^1M^1Por^2M^2Por^3$, $Por^1M^1Pc^1M^2Por^2$, $Pc^1M^1Pc^2M^2Por^1$, $Pc^1M^1Pc^2M^2Pc^3$, $Pc^1M^1Por^1M^2Por^2$, and $Pc^1M^1Por^1M^2Pc^2$ wherein:

M^1, and M^2 are the same or different and each is a metal;

Por^1, Por^2, and Por^3 are the same or different and each is a porphyrinato species; and

Pc^1, Pc^2, and Pc^3 are the same or different and each is a phthalocyaninato species.

Claim 5 (Original): The apparatus of claim 4, wherein M^1 and M^2, when present, are independently selected from metals of the lanthanide series.

Claim 6 (Original): The apparatus of claim 4, wherein said storage molecule has a vertical architecture.

Claim 7 (Original): The apparatus of claim 4, wherein said storage molecule has a horizontal architecture.

Claim 8 (Original): The apparatus of claim 7, wherein said storage molecule is covalently coupled to said electrode by at least two linkers.

Claim 9 (Original): The apparatus of claim 4, wherein said storage molecule comprises a triple-decker sandwich coordination compound having the formula:

$$Por^1Ln^1Pc^1Ln^2Por^2$$

wherein:

Por^1 and Por^2 are the same or different and are each a porphyrinato species;

Ln^1 and Ln^2 are the same or different and each is a lanthanide;

Pc^1 is a phthalocyaninato species; and

said storage molecule has at least 8 different and distinguishable non-zero oxidation states.

Claim 10 (Original): The apparatus of claim 4, wherein said storage molecule comprises a triple-decker sandwich coordination compound having the formula:

$$Pc^1Ln^1Por^1Ln^2Pc^2$$

wherein:

Por^1 is a porphyrinato species;

Ln^1 and Ln^2 are the same or different and each is a lanthanide;

Pc^1 and Pc^2 are the same or different and each is a phthalocyaninato species; and

said storage molecule has at least 8 different and distinguishable non-zero oxidation states.

Claim 11 (Original): The apparatus of claim 4, wherein said storage molecule comprises a triple-decker sandwich coordination compound having the formula:

$$Pc^1Ln^1Pc^2Ln^2Por^1$$

wherein:

Por^1 is porphyrinato species;

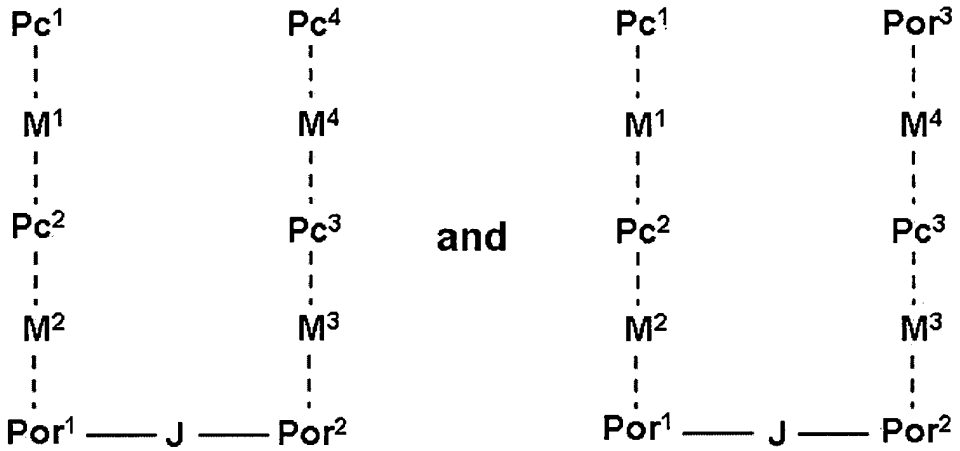
Ln^1 and Ln^2 are the same or different and each is a lanthanide;

Pc^1 and Pc^2 are the same or different and each is a phthalocyaninato species; and

said storage molecule has at least 8 different and distinguishable non-zero oxidation states.

Claim 12 (Original): The apparatus of any one of claims 4, 10, 11, wherein Ln is selected from the group consisting of Eu, and Ce.

Claim 13 (Original): The apparatus of claim 4, wherein said storage molecule has a formula selected from the group consisting of:



wherein

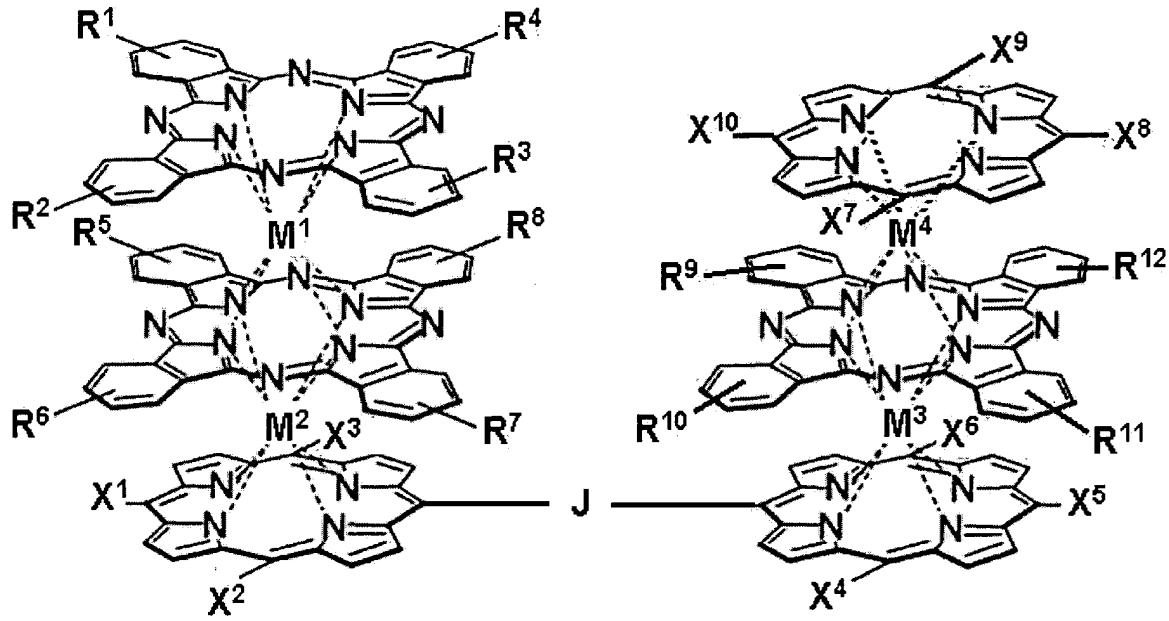
M^1, M^2, M^3, and M^4 are metals independently selected from the lanthanide series or the actinide series;

Por^1, Por^2, Por^3 are are the same or different and each is a porphyrinato species;

Pc^1, Pc^2, Pc^3, and Pc^4 are the same or different and are each phthalocyaninato species; and

J is a covalent bond or a linker.

Claim 14 (Original): The apparatus of claim 13, wherein said storage molecule has a formula:



wherein:

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, and R^{12} are independently selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, and carbamoyl;

X^1, X^2, X^3, X^4, X^5, X^6, X^7, X^8, X^9, and X^{10} are independently selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, and carbamoyl;

at least one R or X is a covalent bond or a linker;

J is a covalent bond or a linker; and

M^1, M^2, M^3, and M^4 are independently selected metals from the lanthanide series.

Claim 15 (Original): The apparatus of claim 14, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, and R^{12} are independently selected from the group consisting of a linker, methyl, *t*-butyl, butoxy, fluoro, and H.

Claim 16 (Original): The apparatus of claim 14, wherein X^1, X^2, X^3, X^4, X^5, X^6, X^7, X^8, X^9, and X^{10} are independently selected from the group consisting of a linker, 4-methylphenyl, 4-*t*-butylphenyl, 4-trifluoromethylphenyl, pentyl, and H.

Claim 17 (Original): The apparatus of claim 14, wherein M^1, M^2, and M^4 are the same.

Claim 18 (Original): The apparatus of claim 14, wherein M^1, M^2, and M^4 are Eu, and M^3 is Ce.

Claim 19 (Original): The apparatus of claim 14, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, and R^{12} are the same.

Claim 20 (Original): The apparatus of claim 14, wherein X^5 is a linker.

Claim 21 (Original): The apparatus of claim 14, wherein X^3 and X^4 are linkers.

Claim 22 (Original): The apparatus of claim 14, wherein X^2 and X^4 are linkers.

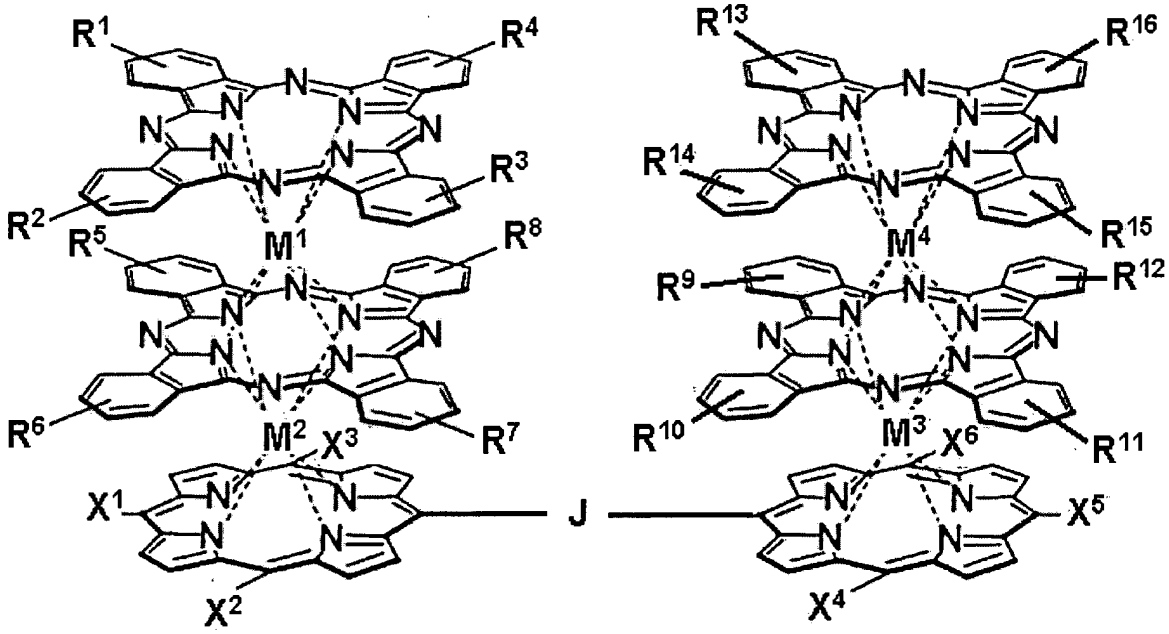
Claim 23 (Original): The apparatus of claim 14, wherein X^1, X^2, and X^3 are the same, and X^5 is a linker.

Claim 24 (Original): The apparatus of any one of claims 20 through 23, wherein said linker is selected from the goup consisting of 4-carboxyphenyl, 2-(4-carboxyphenyl)ethynyl, 4-(2-(4-carboxyphenyl)ethynyl)phenyl, 4-carboxymethylphenyl, 4-(2-(4-carboxymethylphenyl)ethynyl)phenyl, 4-hydroxyphenyl, 2-(4-hydroxyphenyl)ethynyl, 4-(2-(4-hydroxyphenyl)ethynyl)phenyl, 4-hydroxymethylphenyl, 4-(2-(4-hydroxymethylphenyl)ethynyl)phenyl, 4-mercaptophenyl, 2-(4-mercaptophenyl)ethynyl, 4-(2-(4-mercaptophenyl)ethynyl)phenyl, 4-mercaptomethylphenyl, 4-(2-(4-mercaptomethylphenyl)ethynyl)phenyl, 4-selenylphenyl, 2-(4-selenylphenyl)ethynyl, 4-selenylmethylphenyl, 4-(2-(4-selenylphenyl)ethynyl)phenyl, 4-tellurylphenyl, 2-(4-tellurylphenyl)ethynyl, 4-(2-(4-tellurylphenyl)ethynyl)phenyl, 4-tellurylmethylphenyl, and 4-(2-(4-tellurylmethylphenyl)ethynyl)phenyl.

25 (Original): The apparatus of claim 14, wherein J is a linker selected from the group consisting of 4,4′-diphenylethyne, 4,4′-diphenylbutadiyne, 4,4′-biphenyl, 1,4-phenylene, 4,4′-stilbene, 1,4-bicyclooctane, 4,4′-azobenzene, 4,4′-benzylideneaniline, and 4,4″-terphenyl.

Claim 26 (Original): The apparatus of claim 14, wherein said storage molecule has the formula of a dyad selected from the group consisting of dyad2, dyad3, dyad4, and dyad5.

Claim 27 (Original): The apparatus of claim 13, wherein said storage molecule has a formula:



wherein:

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, a and carbamoyl;

X^1, X^2, X^3, X^4, X^5, and X^6 are independently selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, and carbamoyl;

at least one R or X is a covalent bond or a linker;

J is a covalent bond or a linker; and

M^1, M^2, M^3, and M^4 are independently selected metals from the lanthanide series.

Claim 28 (Original): The apparatus of claim 27, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are independently selected from the group consisting of a linker, methyl, *t*-butyl, butoxy, fluoro, and H.

Claim 29 (Original): The apparatus of claim 27, wherein X^1, X^2, X^3, X^4, X^5, and X^6 are independently selected from the group consisting of a linker, 4-methylphenyl, 4-*t*-butylphenyl, 4-trifluoromethylphenyl, pentyl, and H.

Claim 30 (Original): The apparatus of claim 27, wherein M^1, M^2, and M^4 are the same.

Claim 31 (Original): The apparatus of claim 27, wherein M^1, M^2, and M^4 are Eu, and M^3 is Ce.

Claim 32 (Original): The apparatus of claim 27, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are the same.

Claim 33 (Original): The apparatus of claim 27, wherein X^5 is a linker.

Claim 34 (Original): The apparatus of claim 27, wherein X^3 and X^4 are linkers.

Claim 35 (Original): The apparatus of claim 27, wherein X^3 and X^4 are linkers.

Claim 36 (Original): The apparatus of claim 27, wherein X^1, X^2, and X^3 are the same, and X^5 is a linker.

Claim 37 (Original): The apparatus of any one of claims 33 through 36, wherein said linker is selected from the goup consisting of 4-carboxyphenyl, 2-(4-carboxyphenyl)ethynyl, 4-(2-(4-carboxyphenyl)ethynyl)phenyl, 4-carboxymethylphenyl, 4-(2-(4-carboxymethylphenyl)ethynyl)phenyl, 4-hydroxyphenyl, 2-(4-hydroxyphenyl)ethynyl, 4-(2-(4-hydroxyphenyl)ethynyl)phenyl, 4-hydroxymethylphenyl, 4-(2-(4-hydroxymethylphenyl)ethynyl)phenyl, 4-mercaptophenyl, 2-(4-mercaptophenyl)ethynyl, 4-(2-(4-mercaptophenyl)ethynyl)phenyl, 4-mercaptomethylphenyl, 4-(2-(4-

mercaptomethylphenyl)ethynyl)phenyl, 4-selenylphenyl, 2-(4-selenylphenyl)ethynyl, 4-selenylmethylphenyl, 4-selenylmethylphenyl, 4-(2-(4-selenylphenyl)ethynyl)phenyl, 4-tellurylphenyl, 2-(4-tellurylphenyl)ethynyl, 4-(2-(4-tellurylphenyl)ethynyl)phenyl, 4-tellurylmethylphenyl, and 4-(2-(4-tellurylmethylphenyl)ethynyl)phenyl.

Claim 38 (Original): The apparatus of claim 27, wherein J is a linker selected from the group consisting of 4,4′-diphenylethyne, 4,4′-diphenylbutadiyne, 4,4′-biphenyl, 1,4-phenylene, 4,4′-stilbene, 1,4-bicyclooctane, 4,4′-azobenzene, 4,4′-benzylideneaniline, and 4,4″-terphenyl.

Claim 39 (Original): The apparatus of claim 27, wherein said storage molecule has the formula of dyad1.

Claim 40 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium has a memory storage density of at least about 10 gigabits per cm^2 in a sheet-like device.

Claim 41 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium is covalently linked to said electrode.

Claim 42 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage molecule is covalently linked to said electrode by a thiol linker.

Claim 43 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage molecule is covalently linked to said electrode by a linker wherein the coupling to the electrode has the form:

E-L-

where E is the electrode and L, before attachment to the electrode is a linker selected from the group consisting of 4-carboxyphenyl, 2-(4-carboxyphenyl)ethynyl, 4-(2-(4-carboxyphenyl)ethynyl)phenyl, 4-carboxymethylphenyl, 4-(2-(4-carboxymethylphenyl)ethynyl)phenyl, 4-hydroxyphenyl, 2-(4-hydroxyphenyl)ethynyl, 4-(2-(4-hydroxyphenyl)ethynyl)phenyl, 4-hydroxymethylphenyl, 4-(2-(4-hydroxymethylphenyl)ethynyl)phenyl, 4-mercaptophenyl, 2-(4-mercaptophenyl)ethynyl, 4-(2-(4-mercaptophenyl)ethynyl)phenyl, 4-mercaptomethylphenyl, 4-(2-(4-mercaptomethylphenyl)ethynyl)phenyl, 4-selenylphenyl, 2-(4-selenylphenyl)ethynyl, 4-

selenylmethylphenyl, 4-(2-(4-selenylphenyl)ethynyl)phenyl, 4-tellurylphenyl, 2-(4-tellurylphenyl)ethynyl, 4-(2-(4-tellurylphenyl)ethynyl)phenyl, 4-tellurylmethylphenyl, and 4-(2-(4-tellurylmethylphenyl)ethynyl)phenyl.

Claim 44 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage molecule is juxtaposed in the proximity of said electrode such that electrons can pass from said storage molecule to said electrode.

Claim 45 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium is juxtaposed to a dielectric material embedded with counterions.

Claim 46 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium and said electrode are fully encapsulated in an integrated circuit.

Claim 47 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium is electronically coupled to a second electrode that is a reference electrode.

Claim 48 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium is present on a single plane in said device.

Claim 49 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said storage medium is present at a multiplicity of storage locations.

Claim 50 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said apparatus comprises multiple planes and said storage locations are present on multiple planes of said apparatus.

Claim 51 (Original): The apparatus of claim 50, wherein said storage locations range from about 1024 to about 4096 different locations.

Claim 52 (Original): The apparatus of claim 50, wherein each location is addressed by a single electrode.

Claim 53 (Original): The apparatus of claim 50, wherein each location is addressed by at least two electrodes.

Claim 54 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said electrode is connected to a voltage source.

Claim 55 (Original): The apparatus of claim 54, wherein said voltage source is the output of an integrated circuit.

Claim 56 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said electrode is connected to a device to read the oxidation state of said storage medium.

Claim 57 (Original): The apparatus of claim 56, wherein said device is selected from the group consisting of a voltammetric device, an amperometric device, and a potentiometric device.

Claim 58 (Original): The apparatus of claim 57, wherein said device is a sinusoidal voltammeter.

Claim 59 (Original): The apparatus of claim 56, wherein said device provides a Fourier transform of the output signal from said electrode.

Claim 60 (Original): The apparatus of claim 56, wherein said device refreshes the oxidation state of said storage medium after reading said oxidation state.

Claim 61 (Currently amended): The apparatus of claim ~~1~~ 4, wherein said different and distinguishable oxidation states of said storage medium can be set by a voltage difference no greater than about 2 volts.

Claim 62 (Currently amended): A method of storing data, said method comprising:

(i) providing an apparatus according to claim ~~1~~ 4; and

(ii) applying a voltage to said electrode at sufficient current to set an oxidation state of said storage medium.

Claim 63 (Original): The method of claim 62, wherein said voltage ranges up to about 2 volts.

Claim 64 (Original): The method of claim 62, wherein said voltage is the output of an integrated circuit.

Claim 65 (Original): The method of claim 62, further comprising detecting the oxidation state of said storage medium and thereby reading out the data stored therein.

Claim 66 (Original): The method of claim 65, wherein said detecting the oxidation state of the storage medium further comprises refreshing the oxidation state of the storage medium.

Claim 67 (Original): The method of claim 65, wherein said detecting comprises analyzing a readout signal in the time domain.

Claim 68 (Original): The method of claim 65, wherein said detecting comprises analyzing a readout signal in the frequency domain.

Claim 69 (Original): The method of claim 65, wherein said detecting comprises performing a Fourier transform on said readout signal.

Claim 70 (Original): The method of claim 65, wherein said detecting utilizes a voltammetric method.

Claim 71 (Original): A porphyrin half-sandwich complex comprising a cis-A2BC porphyrin complexed with a metal.

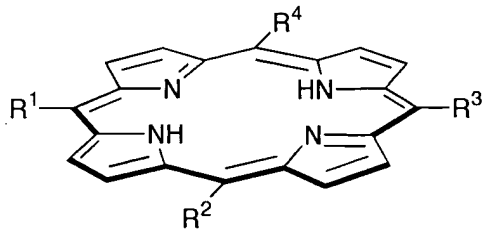
Claim 72 (Original): A method of making a triple-decker sandwich, said method comprising:

providing a metal-porphyrin half-sandwich complex comprising a *cis*-A_2BC type porphyrin complexed with a metal or an ABCD type porphyrin complexed with a metal; and

reacting said half-sandwich complex with a double-decker sandwich complex to form a triple-decker sandwich.

Claim 73 (Original): The method of claim 72, wherein said porphyrin is a cis-A2BC type porphyrin.

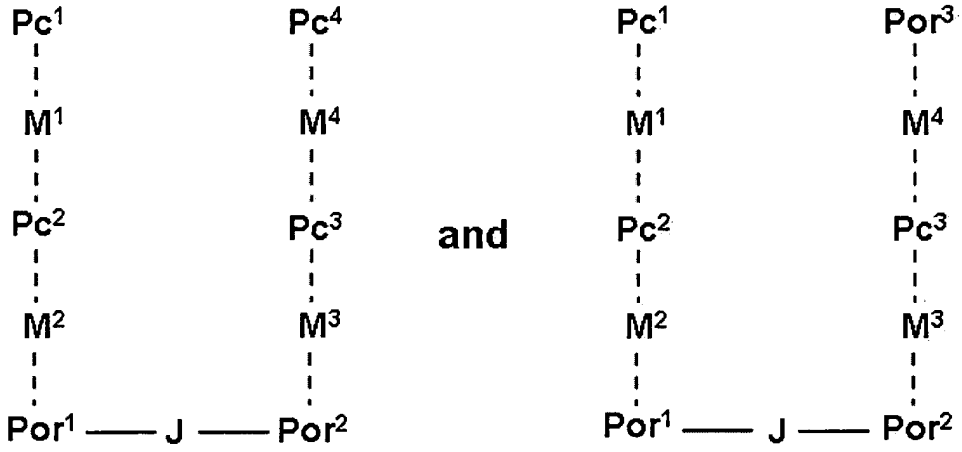
Claim 74 (Original): The method of claim 72, wherein said porphyrin has the formula:



wherein R^1, R^2, R^3, and R^4 are independently selected from the group consisting of *p*-tolyl, *n*-pentyl, 4-bromophenyl, 4-iodophenyl, trimethylsilylethynyl, bromo, iodo, 1,3,2-dioxaborolan-2-yl, 4-(1,3,2-dioxaborolan-2-yl)phenyl, 4-(2-trimethylsilylethynyl)phenyl, 4-formylphenyl, 4-aminophenyl, and 4-iodobicyclo[2.2.2]octan-1-yl.

Claim 75 (Original): The method of claim 72 wherein said double decker sandwich complex is selected from the group consisting of Por-M-Pc and Pc-M-Pc.

Claim 76 (Original): An information storage medium, said storage medium comprising a storage molecule having at least eight different and distinguishable non-zero oxidation states wherein said storage molecule has a formula selected from the group consisting of:



wherein

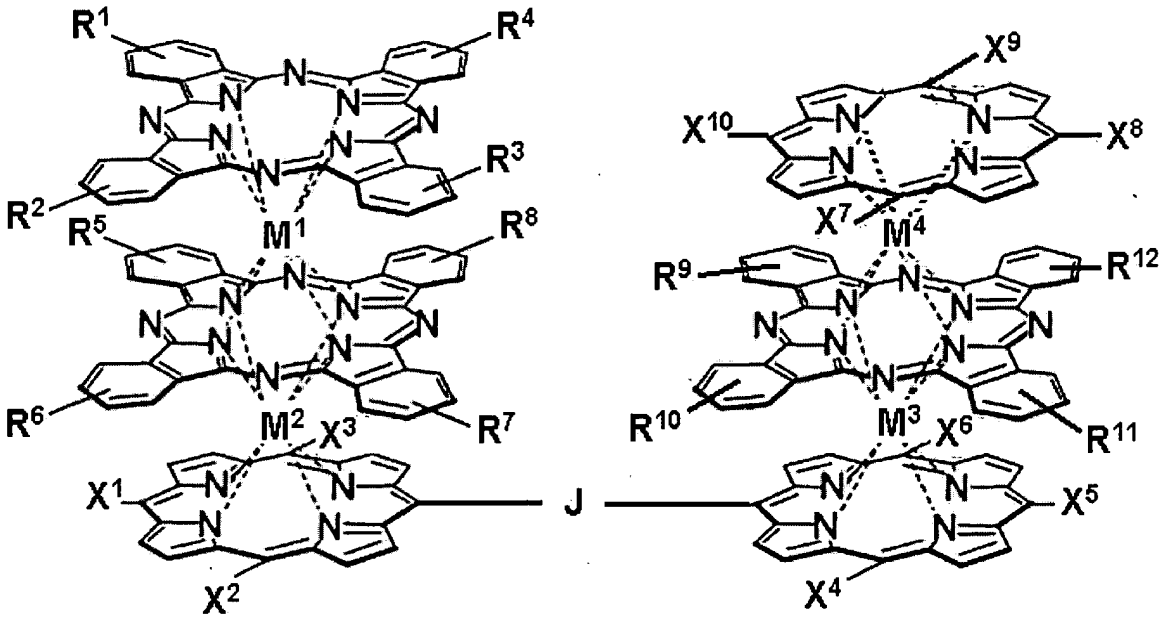
M^1, M^2, M^3, and M^4 are metals independently selected from the lanthanide series or the actinide series;

Por^1, Por^2, Por^3, and Por^4 are are the same or different and each is a porphyrinato species;

Pc^1, Pc^2, Pc^3, and Pc^4 are the same or different and are each phthalocyaninatol; and

J is a covalent bond or a linker.

Claim 77 (Original): The storage medium of claim 76, wherein said storage molecule has a formula:



wherein:

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, and R^{12} are independently selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, and carbamoyl;

X^1, X^2, X^3, X^4, X^5, X^6, X^7, X^8, X^9, and X^{10} are independently selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, and carbamoyl;

at least one R or X is a covalent bond or a linker;

J is a covalent bond or a linker; and

M^1, M^2, M^3, and M^4 are independently selected metals from the lanthanide series.

Claim 78 (Original): The storage medium of claim 77, wherein R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, and R12 are independently selected from the group consisting of a linker, methyl, t-butyl, butoxy, fluoro, and H.

Claim 79 (Original): The storage medium of claim 77, wherein X^1, X^2, X^3, X^4, X^5, X^6, X^7, X^8, X^9, and X^{10} are independently selected from the group consisting of a linker, 4-methylphenyl, 4-*t*-butylphenyl, 4-trifluoromethylphenyl, pentyl, and H.

Claim 80 (Original): The storage medium of claim 77, wherein M^1, M^2, and M^4 are the same.

Claim 81 (Original): The storage medium of claim 77, wherein M^1, M^2, and M^4 are Eu, and M^3 is Ce.

Claim 82 (Original): The storage medium of claim 77, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, and R^{12} are the same.

Claim 83 (Original): The storage medium of claim 77, wherein X^5 is a linker.

Claim 84 (Original): The storage medium of claim 77, wherein X^3 and X^4 are linkers.

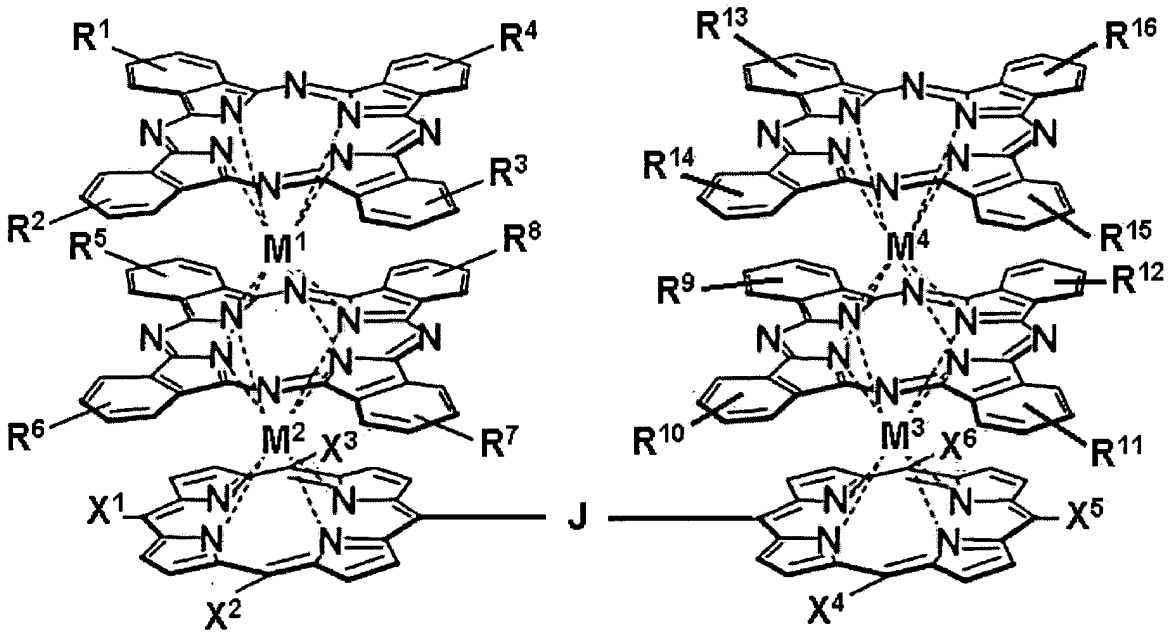
Claim 85 (Original): The storage medium of claim 77, wherein X^2 and X^4 are linkers.

Claim 86 (Original): The storage medium of claim 77, wherein X^1, X^2, and X^3 are the same, and X^5 is a linker.

Claim 87 (Original): The storage medium of claim 77, wherein J is a linker selected from the group consisting of 4,4′-diphenylethyne, 4,4′-diphenylbutadiyne, 4,4′-biphenyl, 1,4-phenylene, 4,4′-stilbene, 1,4-bicyclooctane, 4,4′-azobenzene, 4,4′-benzylideneaniline, and 4,4″-terphenyl.

Claim 88 (Original): The storage medium of claim 77, wherein said storage molecule has the formula of a dyad selected from the group consisting of dyad2, dyad3, dyad4, and dyad5.

Claim 89 (Original): The storage medium of claim 77, wherein said storage molecule has a formula:



wherein:

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, a and carbamoyl;

X^1, X^2, X^3, X^4, X^5, and X^6 are independently selected from the group consisting of a covalent bond, a linker, aryl, phenyl, cycloalkyl, alkyl, halogen, alkoxy, alkylthio, perfluoroalkyl, perfluoroaryl, pyridyl, cyano, thiocyanato, nitro, amino, alkylamino, acyl, sulfoxyl, sulfonyl, amido, and carbamoyl;

at least one R or X is a covalent bond or a linker;

J is a covalent bond or a linker; and

M^1, M^2, M^3, and M^4 are independently selected metals from the lanthanide series.

Claim 90 (Original): The storage medium of claim 89, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are independently selected from the group consisting of a linker, methyl, *t*-butyl, butoxy, fluoro, and H.

Claim 91 (Original): The storage medium of claim 89, wherein X^1, X^2, X^3, X^4, X^5, and X^6 are independently selected from the group consisting of a linker, 4-methylphenyl, 4-*t*-butylphenyl, 4-trifluoromethylphenyl, pentyl, and H.

Claim 92 (Original): The storage medium of claim 89, wherein M^1, M^2, and M^4 are the same.

Claim 93 (Original): The storage medium of claim 89, wherein M^1, M^2, and M^4 are Eu, and M^3 is Ce.

Claim 94 (Original): The storage medium of claim 89, wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} are the same.

Claim 95 (Original): The storage medium of claim 89, wherein X^5 is a linker.

Claim 96 (Original): The storage medium of claim 89, wherein X^3 and X^4 are linkers.

Claim 97 (Original): The storage medium of claim 89, wherein X^2 and X^4 are linkers.

Claim 98 (Original): The storage medium of claim 89, wherein X^1, X^2, and X^3 are the same, and X^5 is a linker.

Claim 99 (Original): The storage medium of claim 89, wherein J is a linker selected from the group consisting of 4,4′-diphenylethyne, 4,4′-diphenylbutadiyne, 4,4′-biphenyl, 1,4-phenylene, 4,4′-stilbene, 1,4-bicyclooctane, 4,4′-azobenzene, 4,4′-benzylideneaniline, and 4,4″-terphenyl.

Claim 100 (Original): The storage medium of claim 89, wherein said storage molecule has the formula of dyad1.

Claim 101 (Currently amended): In a computer system, a memory device, said memory device comprising the apparatus of claim ~~1~~ 4.

Claim 102 (Currently amended): A computer system comprising a central processing unit, a display, a selector device, and a memory device, said memory device comprising the apparatus of claim~~1~~ 4 (Original):